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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/666,493  | 09/19/2003  | Kuo-Tang Hsu         | N1085-90162         | 8017             |
| 54657   | 7590        | 11/03/2006           | EXAMINER            |                  |
| DUANE MORRIS LLP<br>IP DEPARTMENT (TSMC)<br>30 SOUTH 17TH STREET<br>PHILADELPHIA, PA 19103-4196 |             |                      | MACARTHUR, SYLVIA   |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 1763                |                  |

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/666,493

Applicant(s)

HSU ET AL.

Examiner

Sylvia R. MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/23/2006 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☒ Other: Figs from prior art (Marked up by Exr)

### **DETAILED ACTION**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 12, 13 and 29 is rejected under 35 U.S.C. 102(b) as being anticipated by Jeong (US 6,228,211).

Jeong teaches a tank 1, a drain opening 18, and a bubbling plate 3(interpreted as the regulating means) comprising slats 22 and openings, see Fig. 2a. The bubbling plate 3 of Jeong performs both supply (pipe 8) and draining (pipe 18) of the process fluid. During draining fluid in the tank flows from the processing region (area above the bubbling plate) through the bubbling plate through the draining region (area under the bubbling plate) and out the drain to control the draining rate and downward direction of the fluid. The recitation of the use of bubbling plate is to prevent sticking is a matter of an intended use.

### ***Claim Rejections - 35 USC § 103***

3. Claims 1-3, 5-7, 10, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong (US 6,228,211) in view of Shindo et al (US 5,845,660).

Regarding claims 1, 10, and 18: Jeong teaches a tank 1, a drain opening 18, and a bubbling plate 3(interpreted as the regulating means) comprising slats 22 and openings, see Fig. 2a. The examiner has provided a marked-up copy of Figs. 1 and 2a for applicant's convenience.

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Fig.1 illustrates that the bubbling plate. The bubbling plate (comprising slats and openings) is located above drain 18.

Jeong fails to specify that one of the slats covers the drain. This recitation is attributed to the size of the slats.

Shindo et al teaches a substrate washing and drying apparatus wherein a tank is provided with a regulating means 25 comprising slats (solid material of the plate) and openings. Fig. 4 illustrates that at least one of the slats covers pipe 24. Note that the slats of Shindo are wider while the openings are smaller.

The motivation modify the apparatus of Jeong with the regulating means of Shindo et al is that the size of the slats of Jeong promote optimal control of fluid flow. It is well settled that the determination of optimum values of cause effective variables, such as the size of the slats being constructed so as to cover the drain of Jeong is a matter of optimization. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the wafer manufacturing apparatus of Jeong with the regulating means of Shindo et al.

Regarding claims 3 and 13: Jeong further teaches the use of DI water as element 13 in Fig.1.

Regarding claim 5: The bubbling plate of Jeong divides the tank into a processing region (above the bubbling plate) and a draining region (below the bubbling plate).

Regarding claims 6 and 16: Jeong fails to teach that the regulating means is made of PEEK.

Shindo et al teaches a wet etching apparatus wherein the cassette 21 is made of PEEK in col. 7 lines 15-18. Shindo et al further details the properties of PEEK, determining that it is a suitable material of construction in the wet etching environment. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to construct the regulating means of PEEK.

Regarding claim 7: Jeong teaches that the bubbling plate comprises slats and openings see Fig. 2a.

4. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong in view of Shindo as applied in claims 1-3, 5-7, 10, 16, and 18, above, in further view of Sonoda et al (US 6,616,774).

The teachings of Jeong as modified by Shindo et al were discussed above.

The combination of Jeong and Shindo et al fails to teach angling the slats with respect to the regulating plate.

Sonoda et al teaches a wet etching apparatus wherein a rectifying means has openings and angled rods (flow ports 24). See Fig. 1 and col. 4 lines 46-53.

These rods are inclined with respect to the bottom of the tank 20.

The motivation for one of ordinary skill in the art to combine the teachings of Jeong as modified by Shindo with the angled slats of Sonoda et al is that the inclining helps the contaminants to drain in a more controlled fashion and faster from the tank see col. 2 lines 45-63. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Jeong in view of Shindo et al,

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in further view of Sonoda et al to angle the slats and openings of the regulating means to control the direction and rate of outlet flow.

5. Claims 14, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong in view of Sonoda et al (US 6,616,774).

The teachings of Jeong were discussed above.

Jeong fails to teach angling the slats with respect to the regulating plate.

Sonoda et al teaches a wet etching apparatus wherein a rectifying means has openings and angled rods (flow ports 24). See Fig. 1 and col. 4 lines 46-53.

These rods are inclined with respect to the bottom of the tank 20.

The motivation for one of ordinary skill in the art to combine the teachings of Jeong with the angled slats of Sonoda et al is that the inclining helps the contaminants to drain in a more controlled fashion and faster from the tank see col. 2 lines 45-63. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Jeong and Sonoda et al to angle the slats and openings of the regulating means to control the direction and rate of outlet flow.

#### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1-19 and 29 have been considered but are moot in view of the new ground(s) of rejection.

The apparatus of Jeong teaches a tank with a drain 18 and a bubbling plate. Fig. 2a illustrates the vicinity of the bubbling plate (interpreted as the regulation means). The bubbling plate of Jeong controls the flow of fluid both supplying (upward flow through pipe 8 and downward flow through 18).


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Shindo et al illustrates the vicinity of slats (non-perforated material) over pipe 24. The illustration in Fig. 4 shows a slat covering the pipe.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the hours of 8:30 a.m. and 5 p.m..

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Sylvia R MacArthur  
Patent Examiner  
Art Unit 1763

October 30, 2006

FIG. 2a

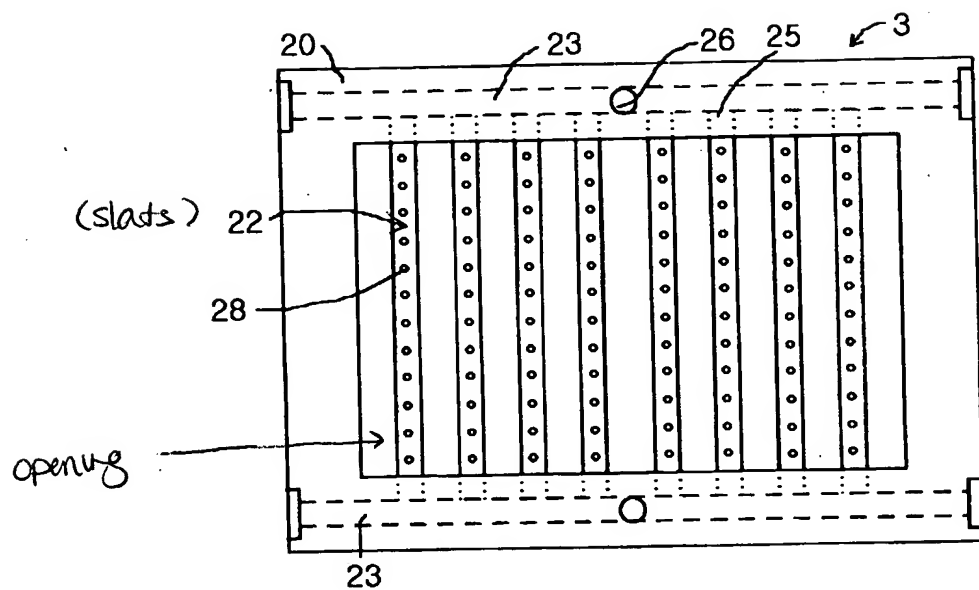
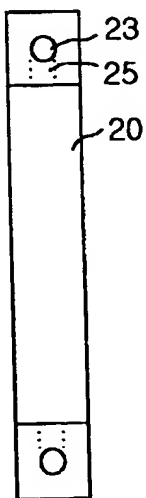


FIG. 2b





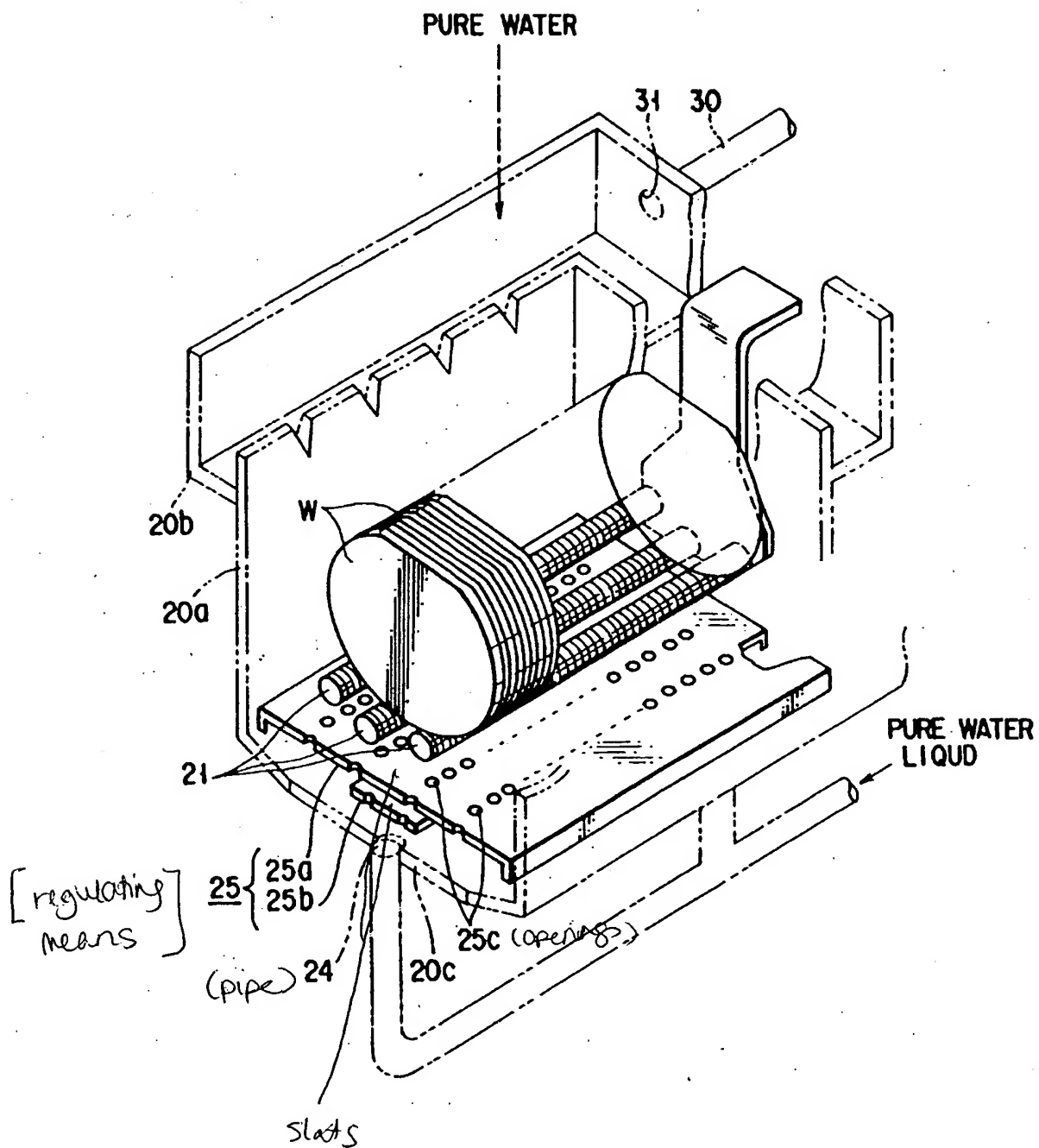


FIG. 4